Developing an Automatic Inductive Fuze Setter for Crusader

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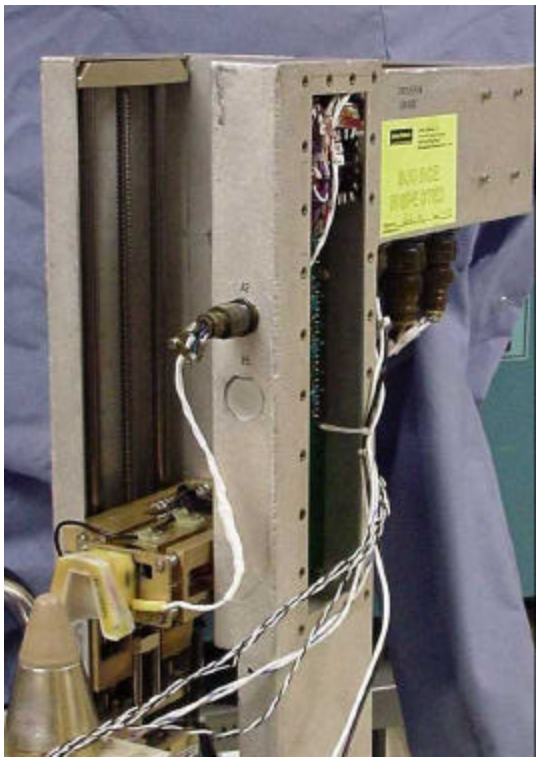

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Outline

- Block Diagram of Crusader Fuze Setter
- Coil Positioning Mechanism
- Coil Development
- Coil Driver Circuit
- Talk Forward Control
- Talk Back Receiver
- “NULL” Problem and Solution
- Fuze Message Storage

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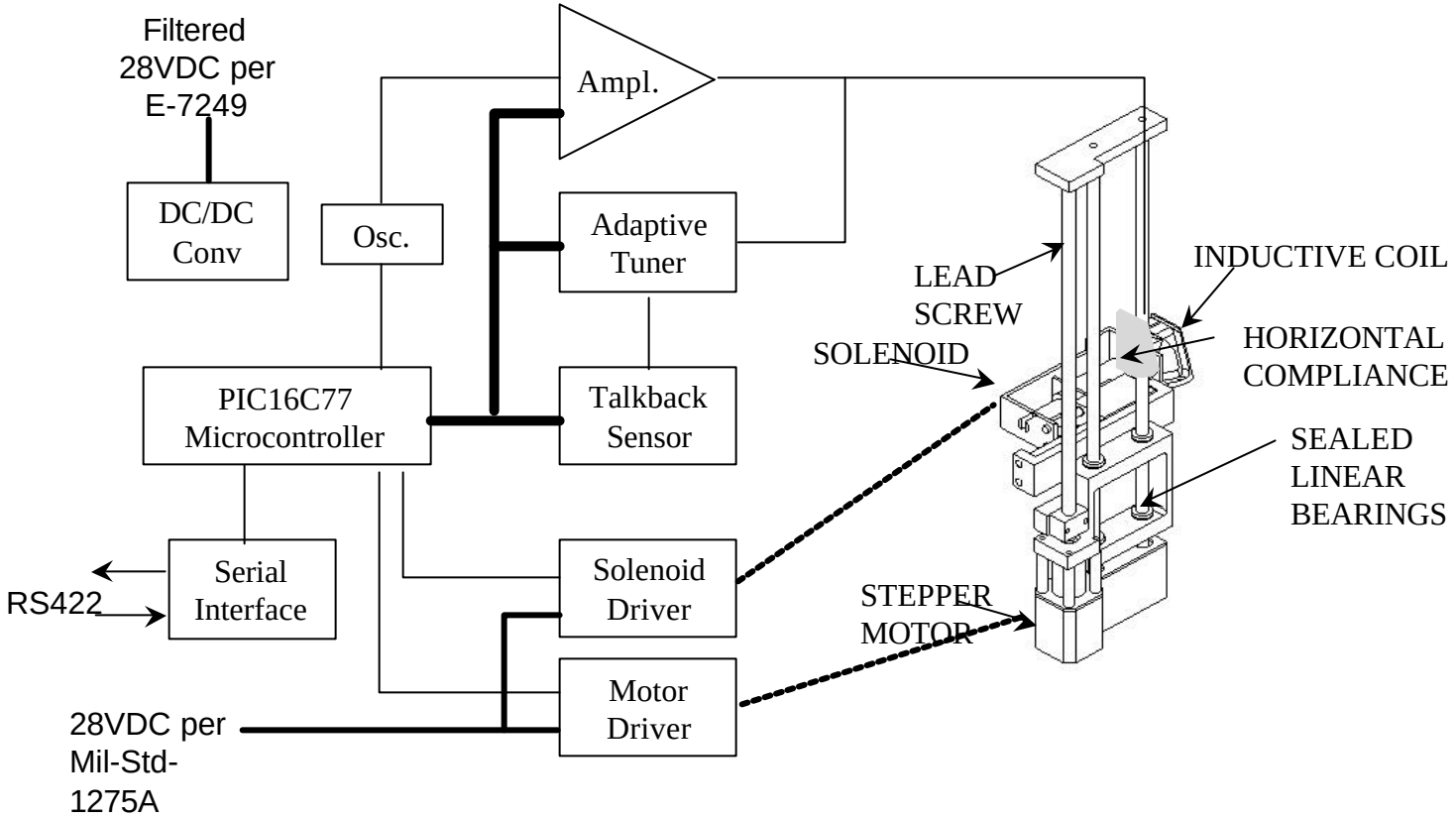
Block Diagram of Crusader Fuze Setter



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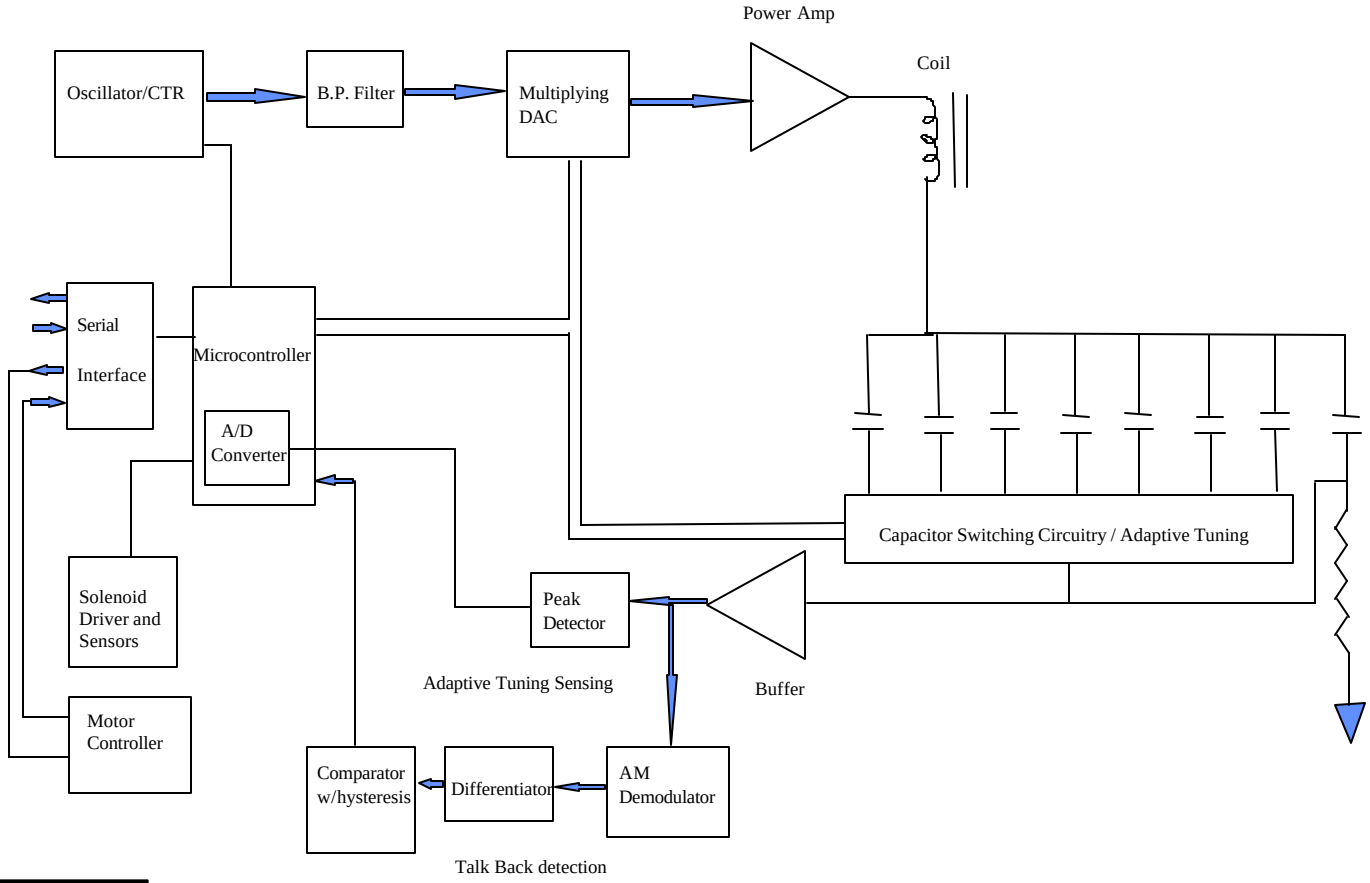
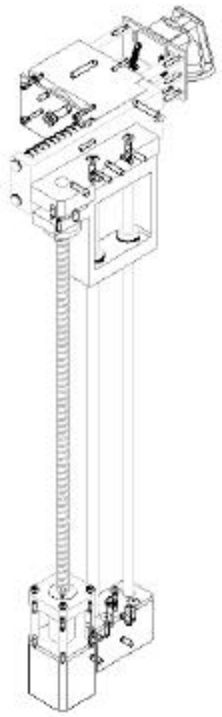
Electronic Block Diagram



Coil Positioning Mechanism

- **Coil is Positioned for Specific Round**



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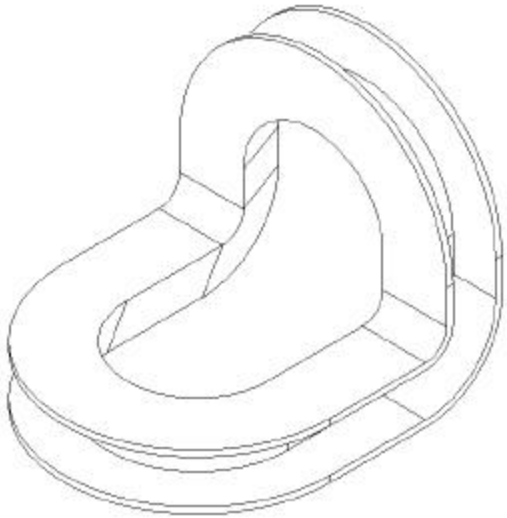
Coil Development

- **"L" Shaped Coil Form**



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Coil Development

- "L" Coil over M782 Fuze

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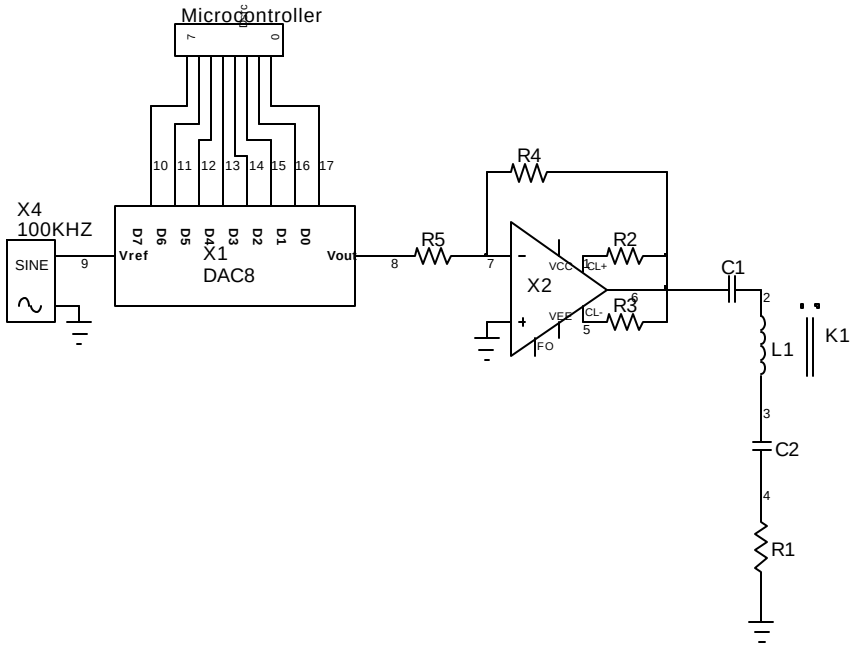
Coil Driver Circuit

- **Power Amplifier**
- **Multiplying D/A**
- **Exponential Decay of Signal**



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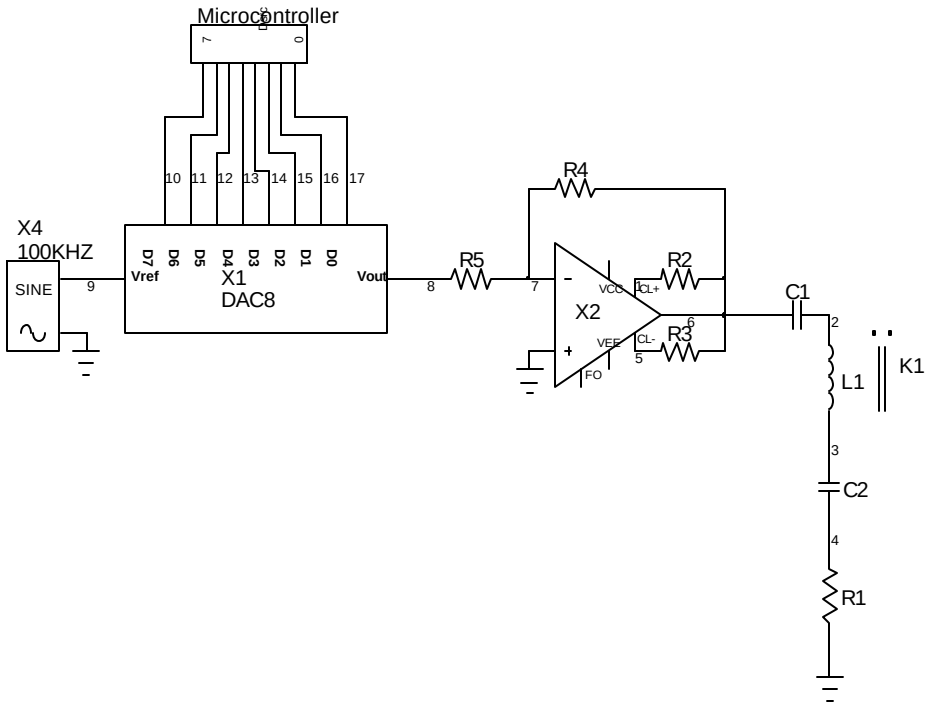
Talk Forward Control

- **Multiplying D/A**
- **100KHZ Carrier**
- **Micro-controller generated Digital Word**



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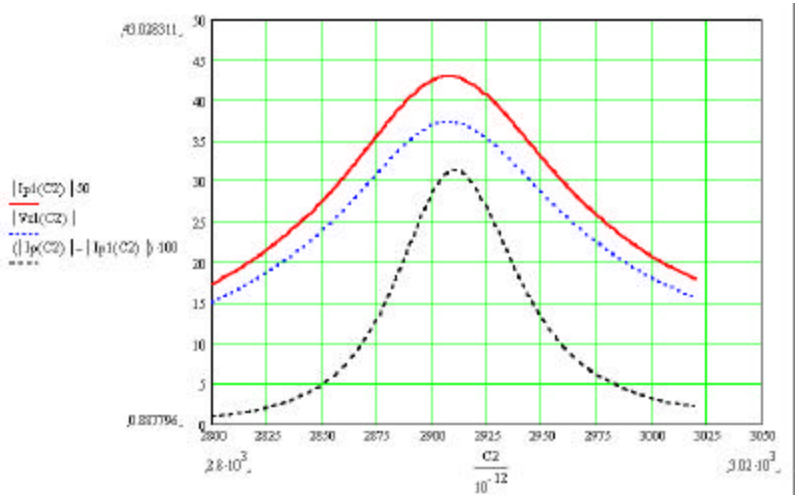
Adaptive Tuning

- **Primary (Setter) Current**
- **Fuze Voltage**
- **Current Difference Signal**



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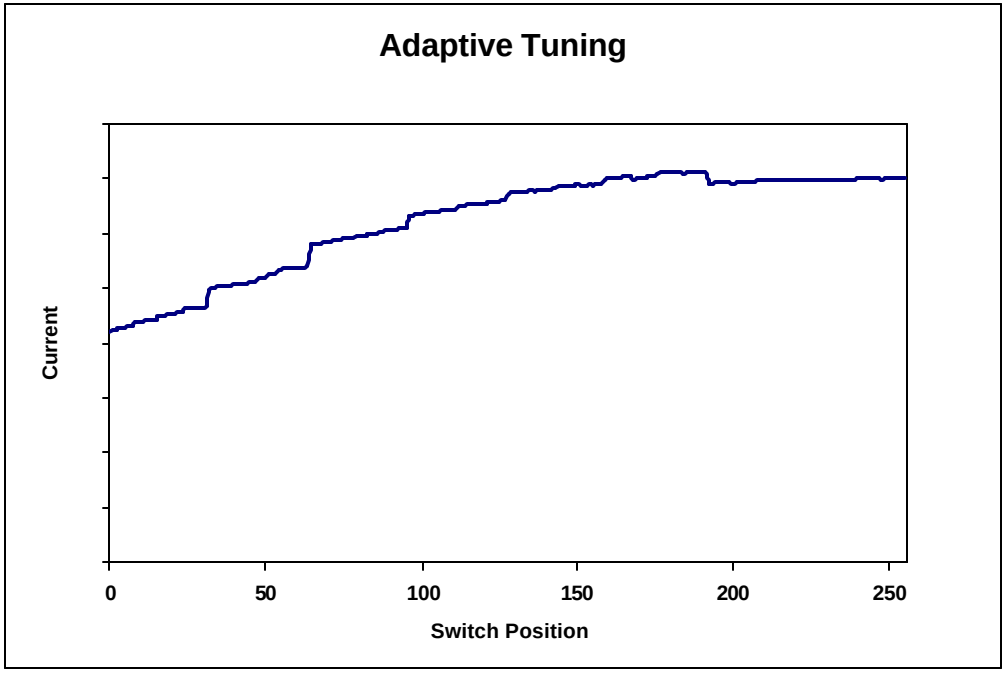
Adaptive Tuning

- **Normalized Data Showing Primary Current During Tuning**



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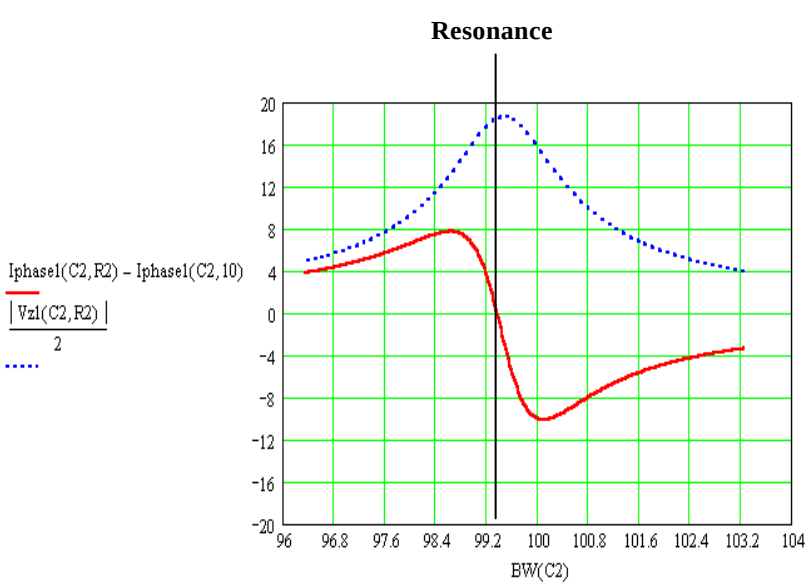
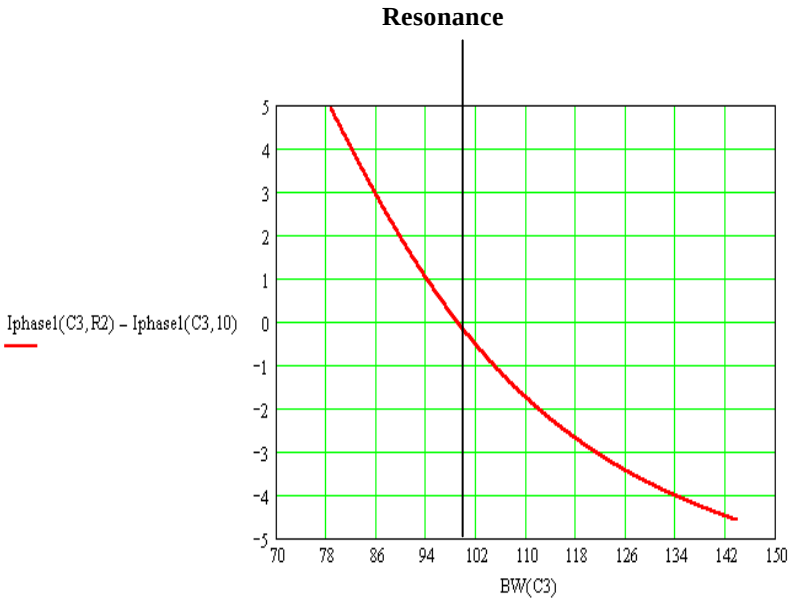
- **Review of "NULL" Problem**



Phase Response and Fuze Voltage Versus Fuze Setter Bandwidth Showing Effect of NULL



Phase Response Versus Fuze Bandwidth Showing Effect of NULL

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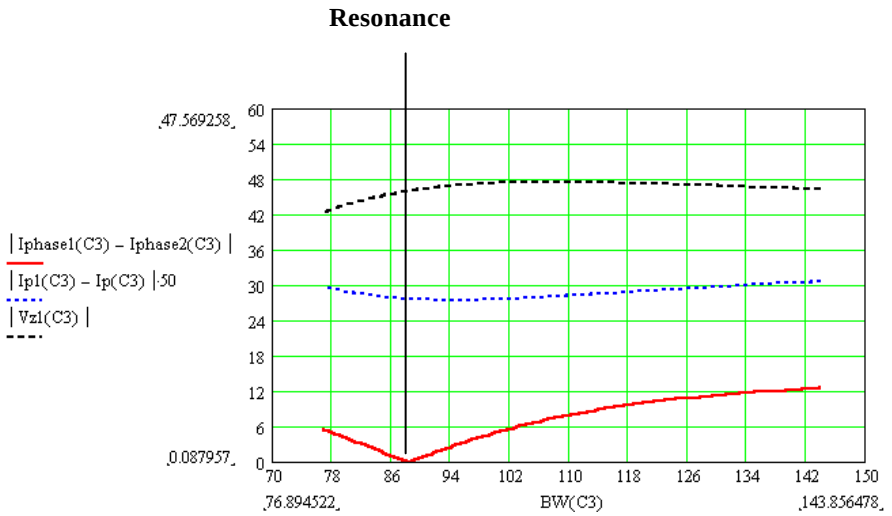
Solution to "NULL" Problem

- **Current Difference Method**
- **Solves "NULL" Problem**



Graphical Output of MATHCAD Model Showing Theoretical Phase Difference, Current Difference and Fuze Voltage VS Gap-Bandwidth

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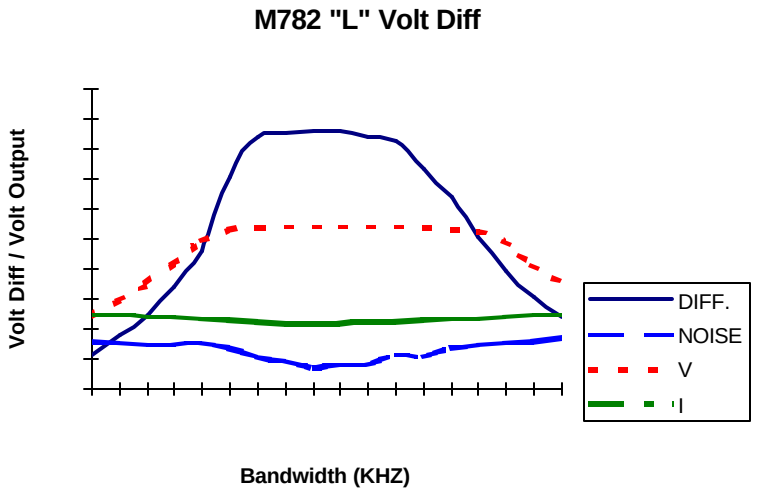
Solution to "NULL" Problem

- **Current Difference Method Normalized Data**



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Expandable Fuze Message Memory

- **Program Accesses a Directory Organized by Fuze ID**
- **Directory points to a Table of Messages**

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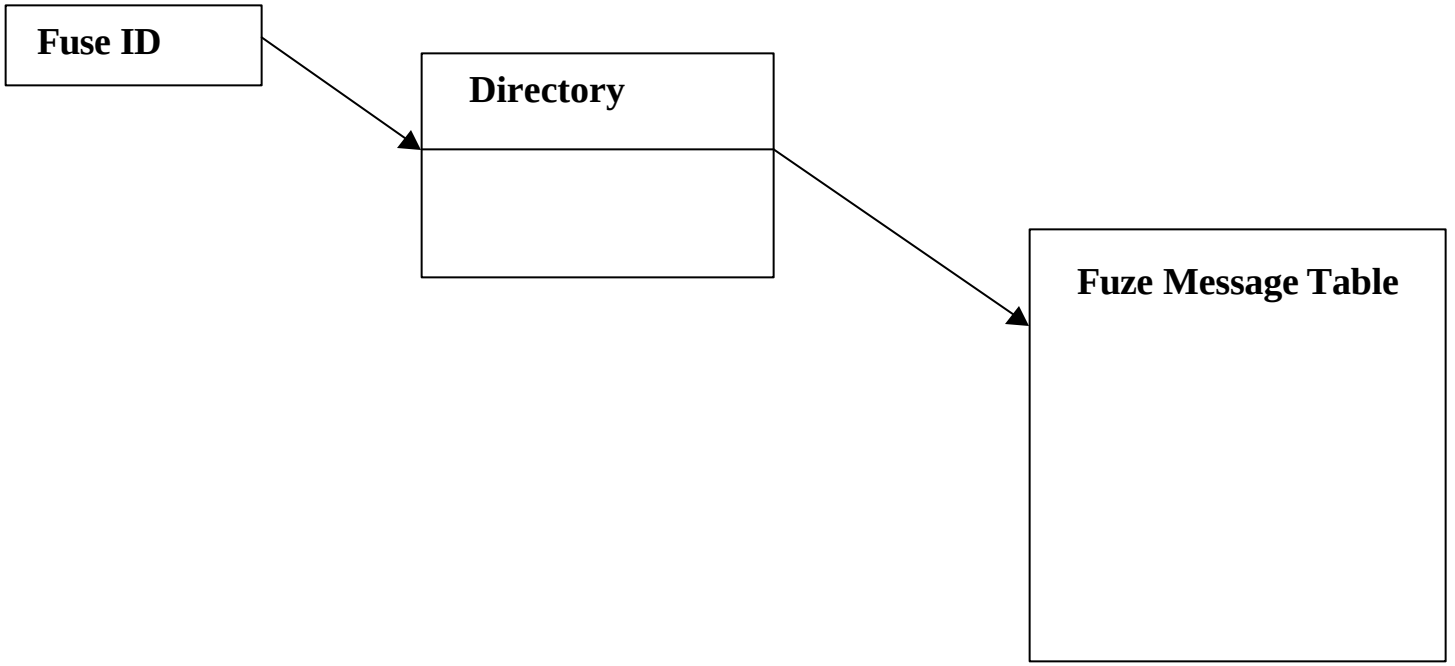
Fuze Message Directory



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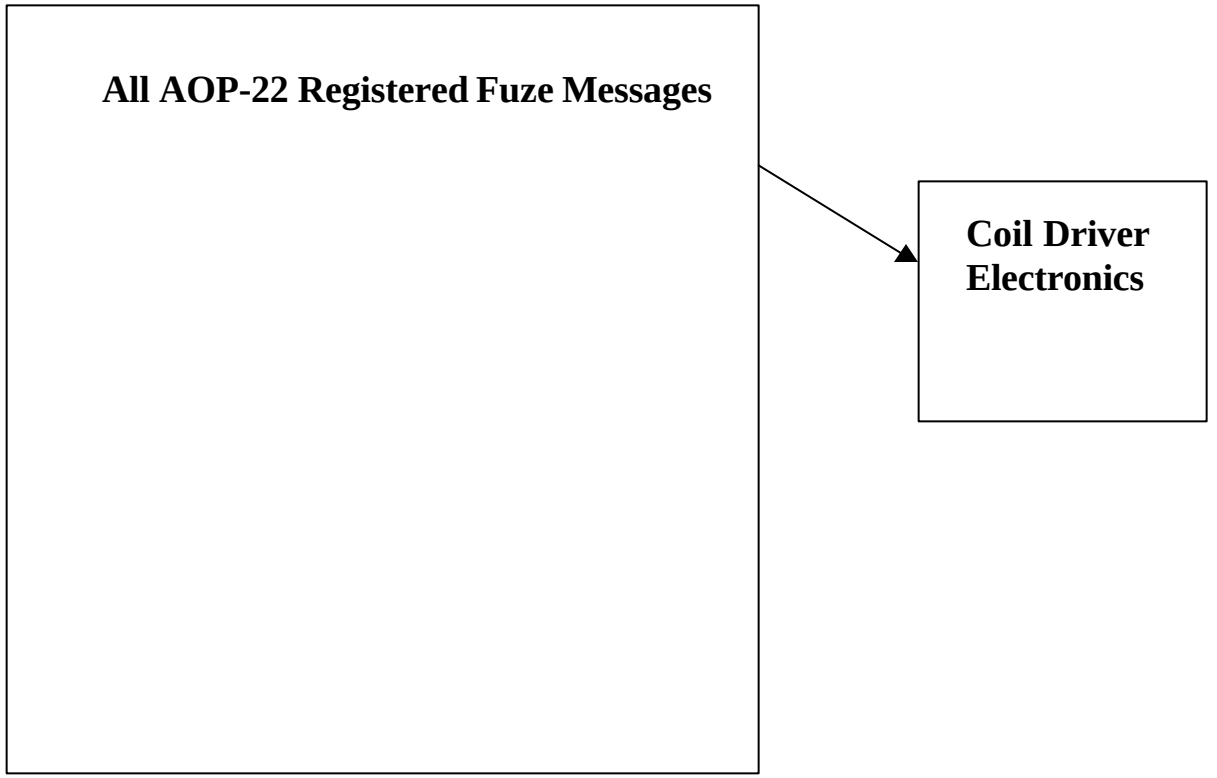
Fuze Message Table



Summary

- **"L" Shaped Coil Developed**
- **Adaptive Tuning of Resonant Circuit**
- **"NULL" Problem Solved**
- **Expandable Fuze Message Storage Scheme**